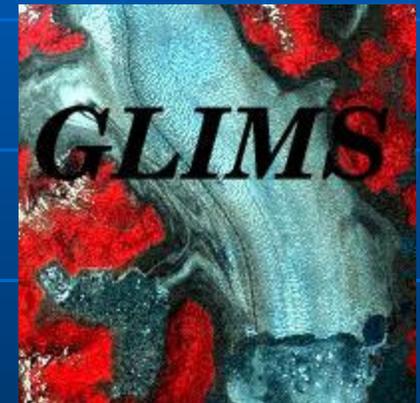


# GLIMS Geospatial Data Model for Glacier Analysis Data

NASA ESDS Standards Process Group Meeting  
15 June 2005  
San Diego, CA



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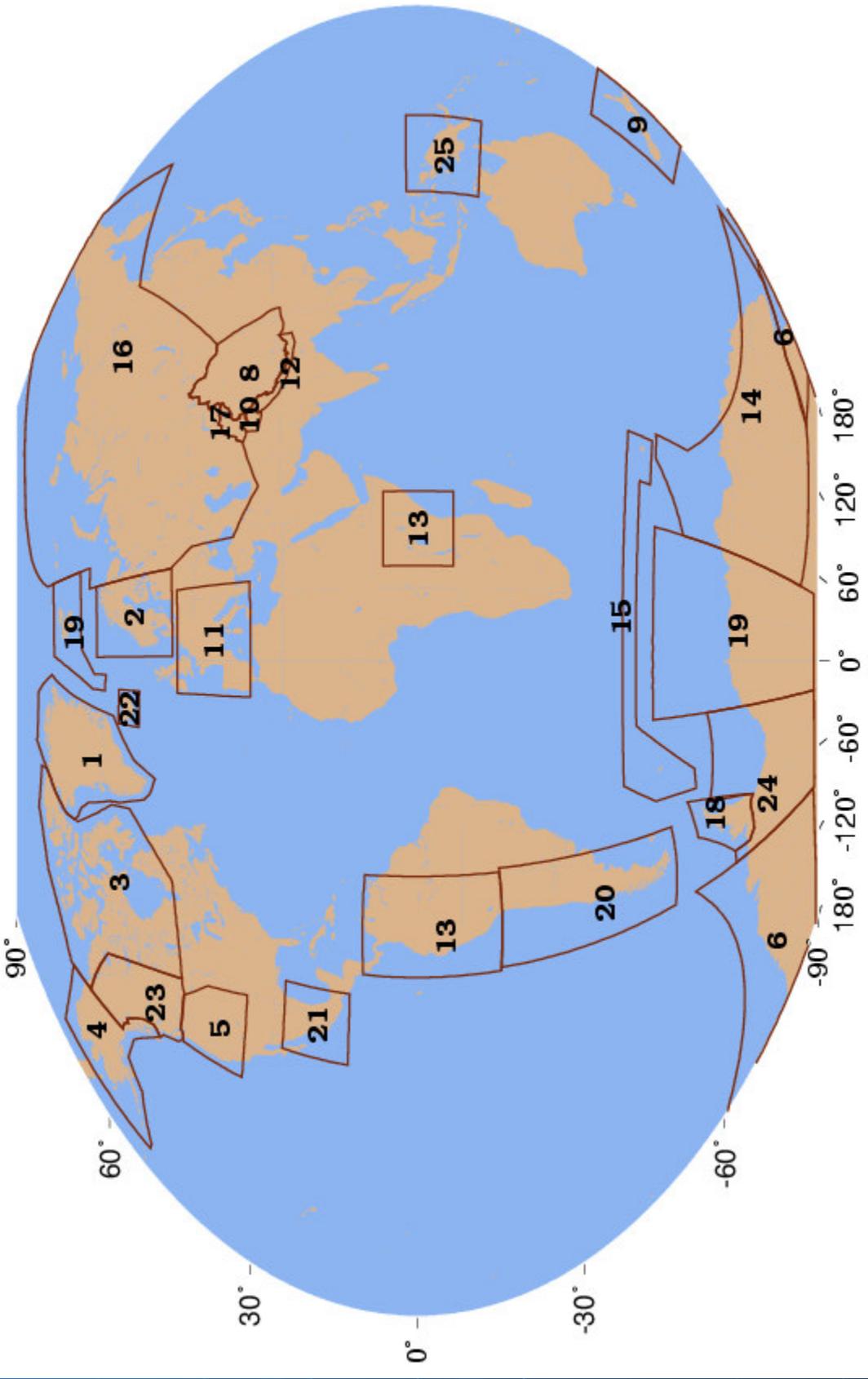
# GLIMS History

- Goal: to establish an inventory of global land ice (glaciers, ice caps, ice sheet margins)
- Begun in 1995 by Hugh Kieffer (USGS/Flagstaff) as ASTER Science Team Activity
- Data source: primarily ASTER, then Landsat, NTM, maps

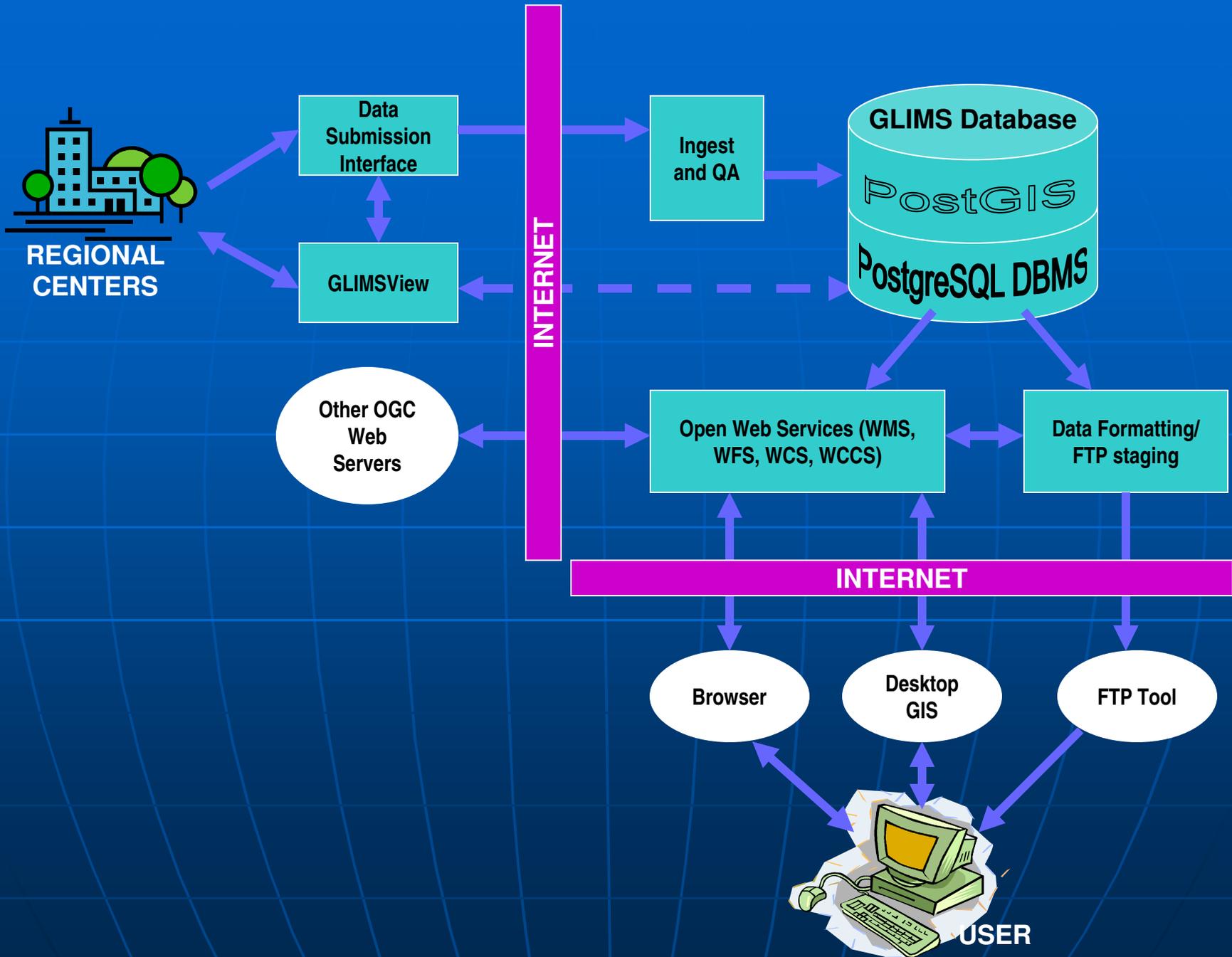
# The GLIMS Concept

- International consortium of Regional Centers
- Special ASTER Data Acquisition Requests for glaciers
- Unique data model for glacier data
- Custom analysis tools, GLIMSView with algorithms for analysing glaciers in imagery

# GLIMS Regions

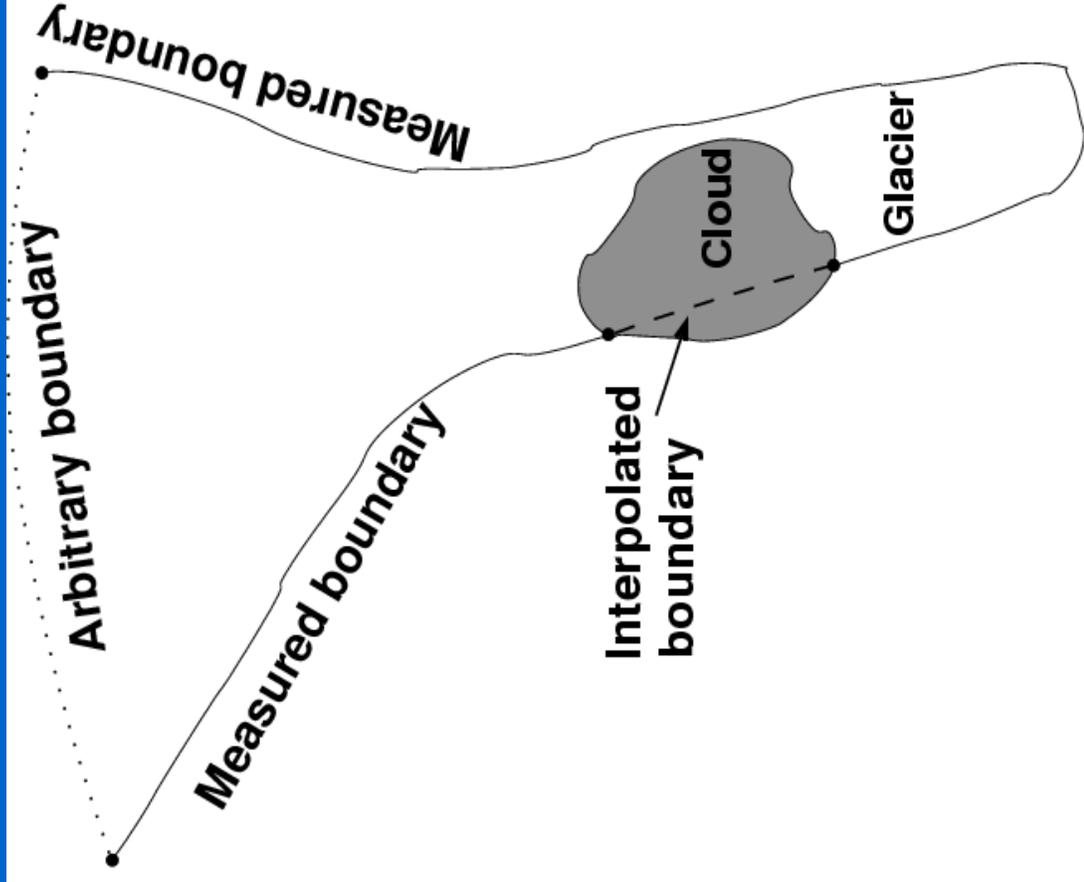






# Some Specific Design Decisions

- A "glacier" is the fundamental unit in the database.
- Ice shelves are one type of "glacier"
- Glacier outlines are closed polygons
- Outlines are composed of "segments" with attributes:
  - "Measured" or "Arbitrary"
  - Segment type: terminus, ice divide, etc.
  - Material and feature on either side of boundary
- Estimates of error in position measurements are explicitly stored.



- Boundaries composed of different types of segments
- Segments are tagged with both type and uncertainty

# Main Database Tables

- Glacier\_Static (glacier name, location)
- Glacier\_Dynamic ("snapshots" in time of the glacier:
  - Outlines, velocity, snowlines, etc.
  - The procedures employed for obtaining the above.
- Images
- Ancillary data (DEMs, other raster data)
- Institution information
- Literature references



# The OGC-Compliant Interface

- The database now contains GLIMS outlines and metadata on approximately 1500 glaciers.
- The glacier data layer is queryable, so that scalar attribute data, such as analyst name, date of contribution, etc. may be displayed and, if desired, downloaded in a variety of user-selectable formats.
- Because our website is an OGC-compliant Web Map Service and Web Feature Service, other websites can display glacier layers from our site over the Internet, or retrieve glacier features in vector format.



# Conclusions

- The GLIMS project has designed a geospatial database for storing information about glaciers.
  - Static and dynamic
  - Scalar and vector
  - Compatible with the World Glacier Inventory (static scalar information only)
- Adoption as community standard would facilitate meta analysis and comparisons
- Learn more at tonight's poster session